ONTARIO MINISTRY OF ENVIRONMENT
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1971 OPERATING SUMMARY

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PICKERING VILLAGE

WATER POLLUTION CONTROL PLANT

TD
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P53
1971

Pickering Village : water pollution control plant.
81551

Water management in Ontario

Ontario
Water Resources
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.

DS Caverly
D.S. Caverly,
General Manager.

D McTavish
D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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135 St. Clair Avenue West
Toronto 195

PICKERING VILLAGE

WATER POLLUTION CONTROL PLANT

1971 ANNUAL OPERATING SUMMARY

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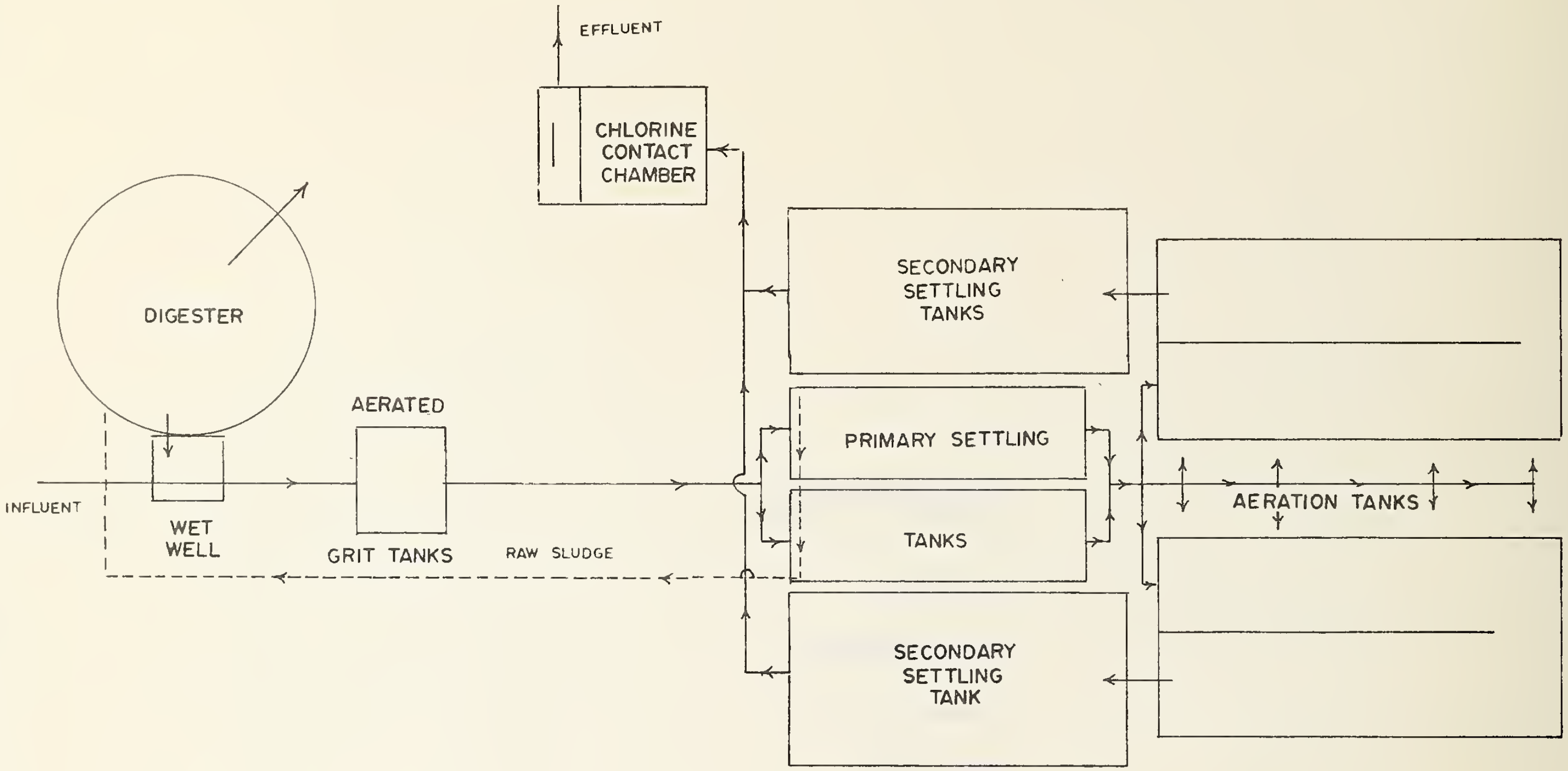


PICKERING WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT NO.		1-0015-66
TREATMENT		Con. Secondary
DESIGN FLOW		0.40 migd
BOD	- Raw Sewage	220 mg/l
	- Removal	90-95%
SS	- Raw Sewage	250 mg/l
	- Removal	90-95%

GRIT REMOVAL

Type: Aerated with airlift
Size: One 12' x 14' x 10' (eff. depth)
Volume: 1680 ft^3 or 10,500 gal
Detention: 38 minutes

COMMINUTION

Bar Screen - on by-pass

PRIMARY SEDIMENTATION

Size: Two 20' x 12' x12'6" (avg. depth)
Volume: 6000 ft^3 or 37,400 gal
Detention: 2.25 hours
Loading: Surface 795 gpd/ft^2 Weir

AERATION

Type: Diffused air, two-pass
Size: Two 35' x 2 x 12' x 12'
Volume: 20,000 ft^3 or 125,000 gal
Detention: 7.5 hours
Diffusers: Ceramic Tubes (17 per pass)

SECONDARY SEDIMENTATION

Size: Two 25' x 12' x 11'6" (avg)
Volume: 6900 ft^3 or 43,000 gal
Detention: 2.58 hr
Loading: Surface 666 gpd/ft^2
Weir 4160 gpd/ft

CHLORINE CONTACT CHAMBER

Size: 4 passes 12' x 5'4" x 10'9"
Volume: 2750 ft^3 or 17,200 gal
Detention: 62 minutes

DIGESTION

Single Stage, gas mixed, fixed concrete roof
Size: one 28' dia x 24' swd
Volume: 15,200 ft^3 or 95,000 gal

GENERAL

This project consists of a secondary sewage treatment plant with digestion and a sewage collector system which includes a submersible pumping station.

During the year a ½-ton pickup truck was purchased and used extensively for sewer cleaning, grit disposal and minor errands in and out of the Village.

Near the end of the year, preparations were made for the project to assume responsibility for sewers which were constructed in new subdivisions. An operating agreement for these is expected early in the coming year.

PLANT FLOWS and CHLORINATION

The total flow to the plant during 1971 was 58.0 million gallons. The average daily flow was 0.16 million gallons while the maximum daily flow recorded was 0.73 million gallons. The maximum rate at which the plant received raw sewage was 1.30 million gallons per day.

Chlorine was applied to the plant effluent for the full 12 months of the year. A total of 2,268 pounds of chlorine was used at an average dosage of 3.9 mg/l to produce a residual in the effluent of 0.5 mg/l.

PLANT EFFICIENCY

The average influent BOD and suspended solids were 242 mg/l and 264 mg/l respectively. The average effluent BOD and suspended solids were 6 mg/l and 8 mg/l respectively. This represents an average reduction of 98 percent BOD and 97 percent suspended solids.

There was an average reduction of 78 percent in total phosphorus for 1971.

SLUDGE DIGESTION and DISPOSAL

A total of 394,000 gallons of raw sludge, averaging 6.0 percent total solids was pumped to the digester.

During the same period, 1,057 cubic yards of digested sludge containing 5.5 percent total solids were hauled by a private contractor for disposal on land.

CONCLUSIONS

The total flow to the plant continued to increase during the year. The influent BOD also increased while the influent suspended solids remained the same. The increase in BOD with no increase in suspended solids indicates a reduction in surface water entering the system.

Although the plant has reached its organic design loading, the hydraulic design loading has not been reached. This is a good indication that there are no combined sewer connections and little infiltration.

ONTARIO WATER RESOURCES COMMISSION

PICKERING SEWAGE WORKS SYSTEM

PROJECT NO. 1-0015-66

BALANCE SHEET

AS AT DECEMBER 31, 1971

(UNAUDITED)

ASSETS

ACCOUNTS RECEIVABLE		$ 30,480.63
FIXED ASSETS (at cost)		1,404,470.06
TOTAL ASSETS		$1,434,950.69

LIABILITIES AND EQUITY

CURRENT LIABILITIES		$ 10,304.37
LONG TERM DEBT		1,194,430.82
EQUITY		
Contributed		341,976.63
Amortized principal on long term debt		12,357.42
Earned Surplus/Deficit		
Deficit at beginning of year	($ 82,528.86)	
Deficit for the year 1971	($ 41,589.69)	(124,118.55)
TOTAL LIABILITIES AND EQUITY		$1,434,950.69

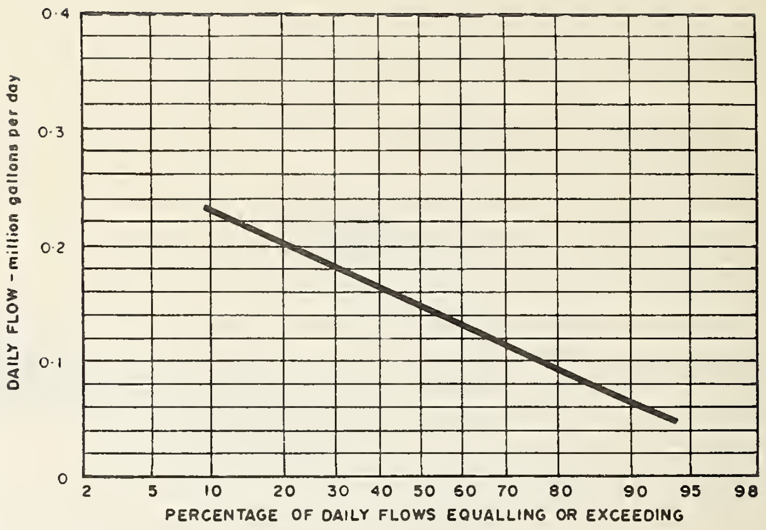
Notes

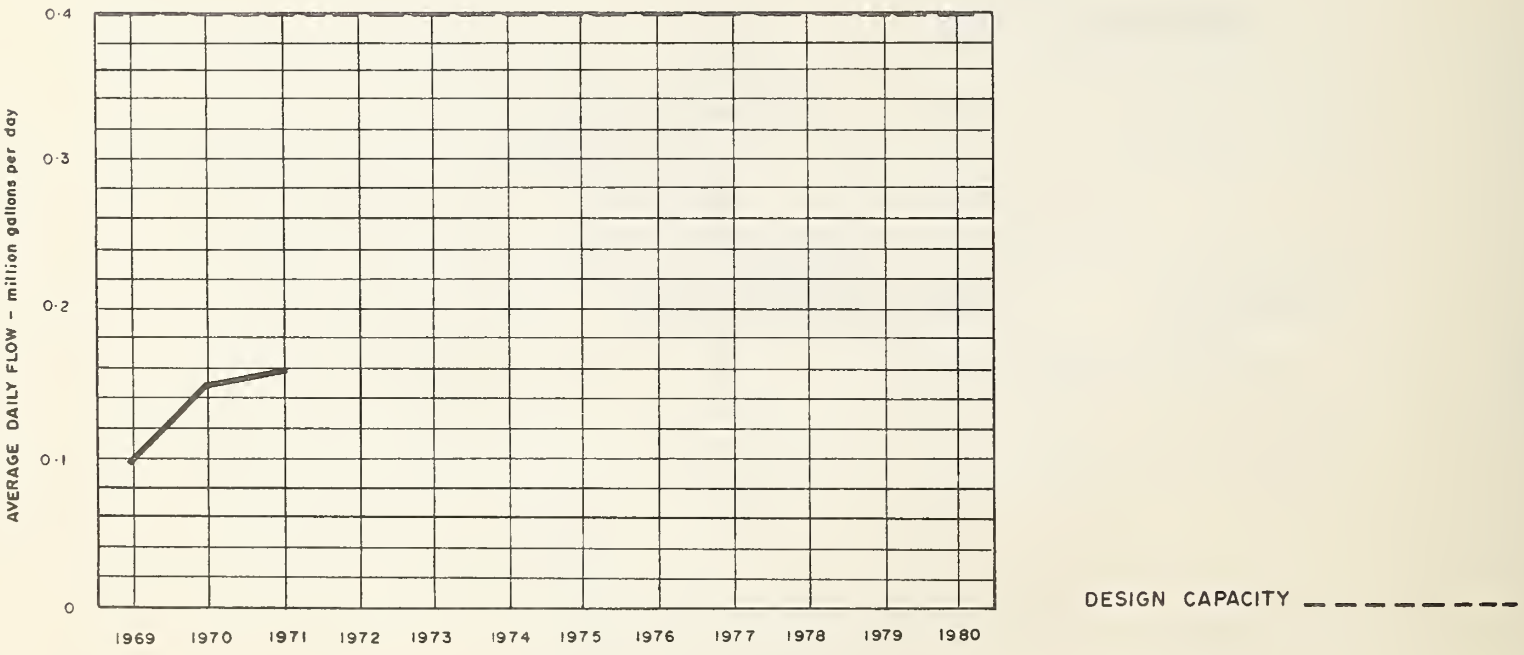
Prepared on accrued basis.

Contributed equity includes Provincial Assistance in the amount of $150,278.30.

PROCESS DATA

FLOWS

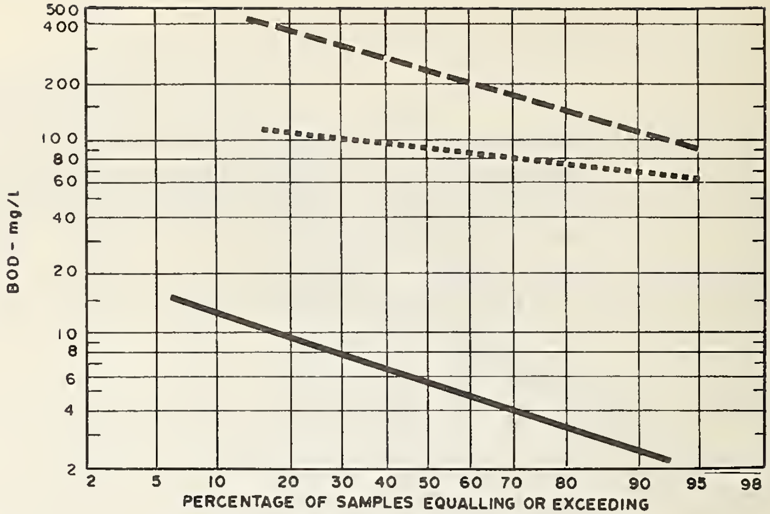

DAILY FLOW - million gallons per day
0·4
0·3
0·2
0·1
0
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENTAGE OF DAILY FLOWS EQUALLING OR EXCEEDING

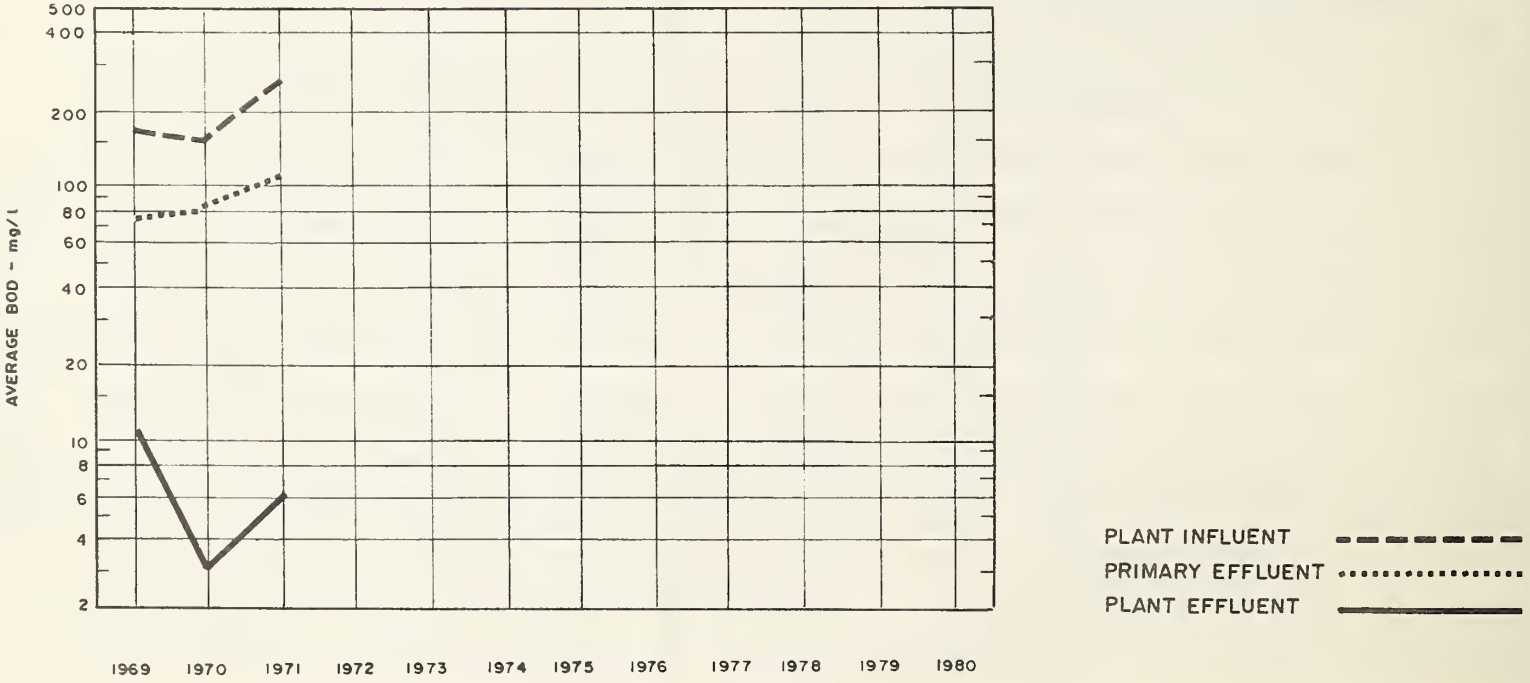

AVERAGE DAILY FLOW - million gallons per day
0·4
0·3
0·2
0·1
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
DESIGN CAPACITY - - - - - - - -

PLANT PERFORMANCE

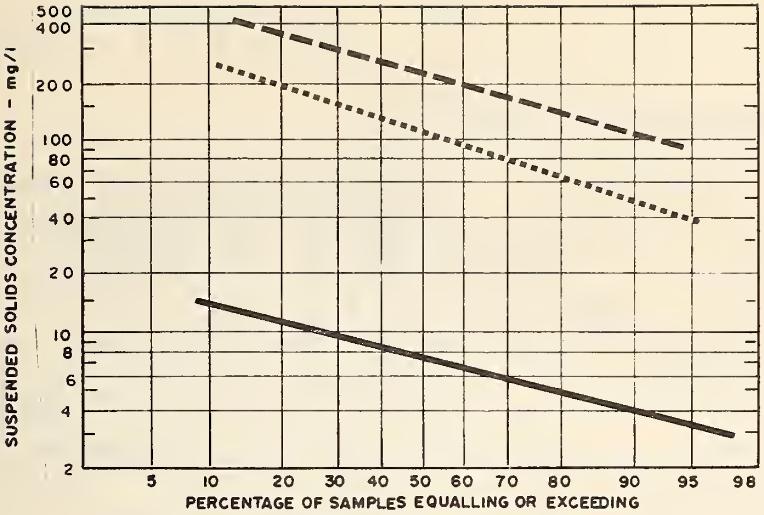
MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS		
	TOTAL FLOW million gallons	AVERAGE DAY mil gal	MAXIMUM DAY mil gal	MAXIMUM RATE mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION %	REDUCTION 10^3 pounds	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION %	REDUCTION 10^3 pounds	INFLUENT mg/l as P	EFFLUENT mg/l as P	REDn %
JAN	3.9	.12	.20	.30	-	-	-	-	124	7	94	4.6	-	-	-
FEB	4.8	.17	.73	1.26	-	-	-	-	132	4	95	6.0	-	-	-
MAR	8.7	.28	.56	1.20	250	6	98	21.2	163	7	96	13.5	5.5	3.0	45
APR	6.3	.20	.44	.52	220	5	98	13.4	164	5	97	10.1	8.5	1.5	82
MAY	3.9	.12	.17	.22	200	4	98	7.7	237	7	97	9.0	-	-	-
JUNE	3.7	.12	.17	.84	220	3	99	8.1	267	8	97	9.6	-	1.3	-
JULY	4.5	.15	.25	.64	130	3	98	5.8	242	7	97	10.7	4.4	1.3	70
AUG	4.6	.15	.77	1.30	380	7	98	17.3	342	7	98	15.5	18.0	2.6	86
SEPT	1.7	.06	.13	.80	200	1	99+	3.3	392	9	98	6.4	9.6	2.8	71
OCT	3.2	.10	.19	.30	400	-	-	-	514	9	98	16.4	13.0	3.0	77
NOV	4.9	.16	.21	.32	180	7	96	8.4	308	9	97	14.5	14.0	2.1	85
DEC	7.8	.25	.40	1.00	240	13	94	17.7	233	14	94	17.0	9.9	1.0	90
TOTAL	58.0	-	-	-	-	-	-	-	-	-	-	133.3	-	-	-
AVG.	-	.16	MAXIMUM .73	MAXIMUM 1.30	242	6	98	11.4	264	8	97	11.1	10.2	2.2	78
No. of Samples	-	-	-	-	11	10	-	-	61	60	-	-	9	10	-

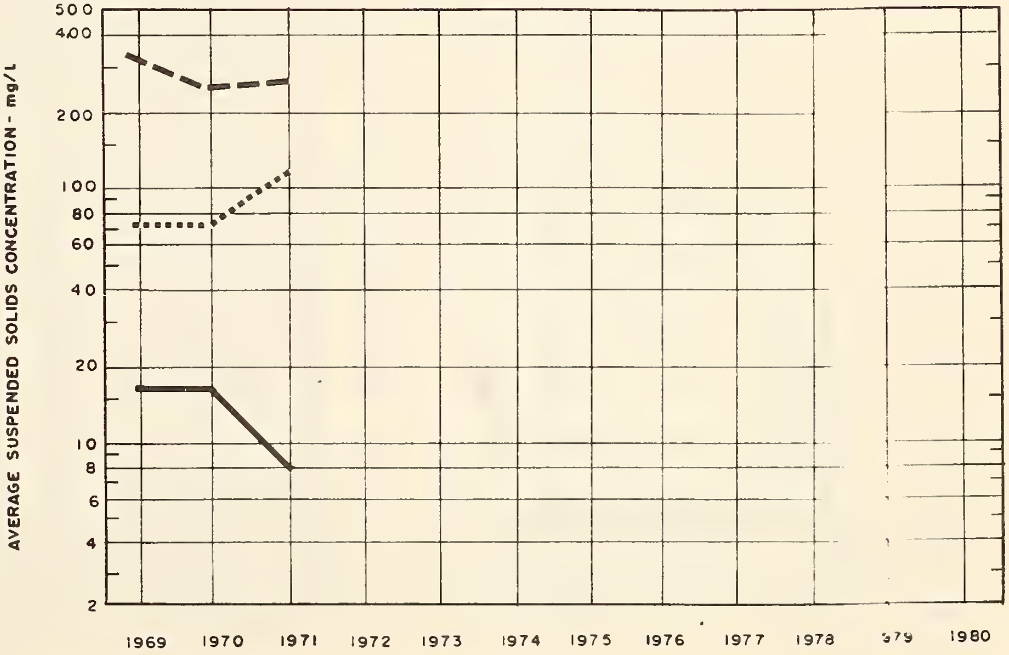
BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS





PLANT INFLUENT ▬ ▬ ▬ ▬ ▬ ▬

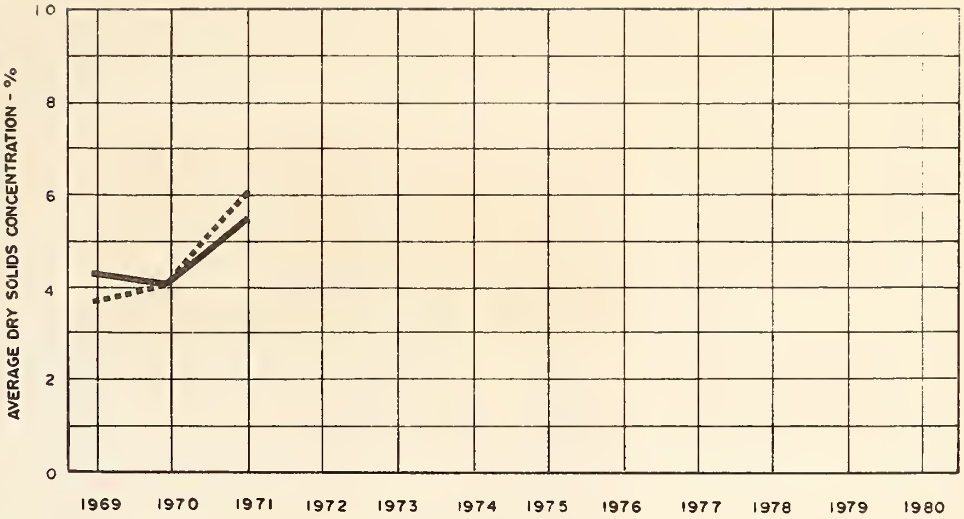
PRIMARY EFFLUENT ••••••••••••••••

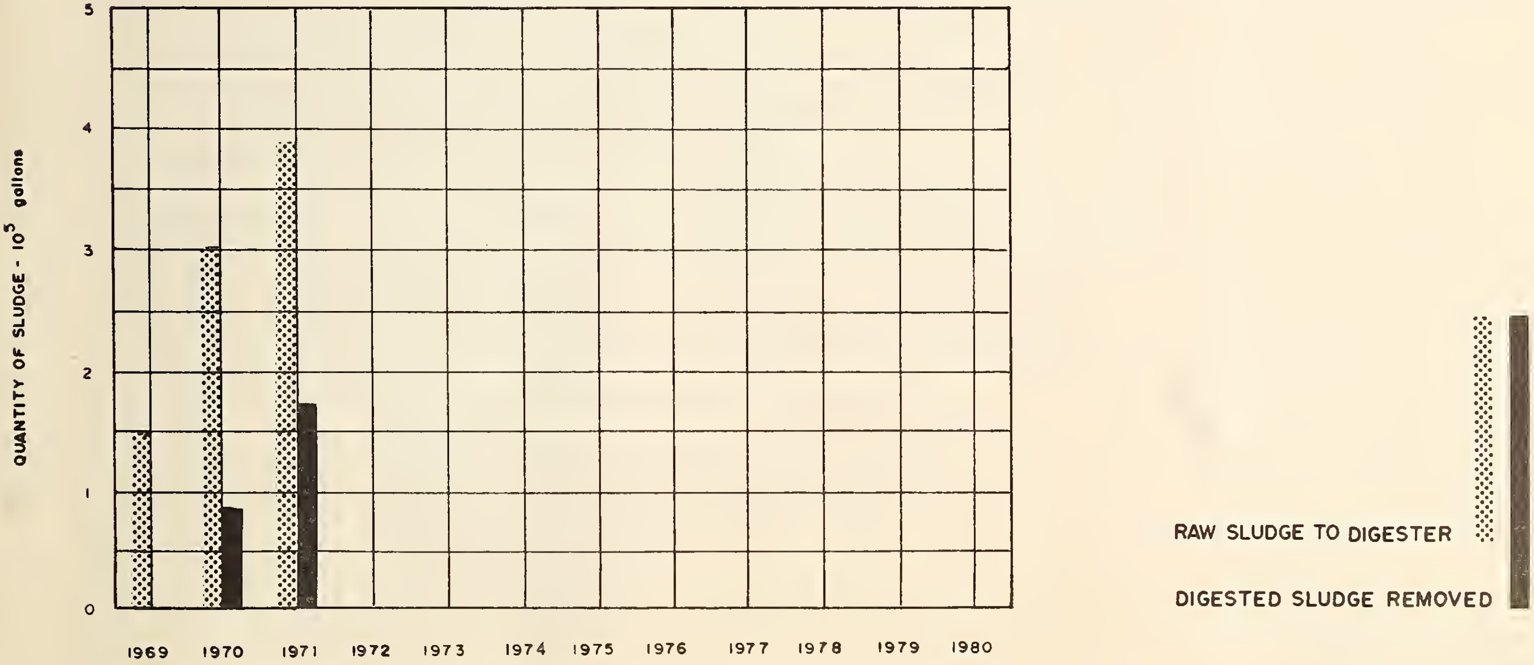
PLANT EFFLUENT ▬▬▬▬▬▬▬▬

TREATMENT DATA

	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE				
MONTH	QUANTITY REMOVED cubic feet	Cl_2 USED pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR $\frac{1000 ft^3}{lb BOD}$	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	SUPERNATANT T.S. %	AMOUNT HAULED cubic yards
JAN	6	186	4.8	-	65	690	-	-	39	1.7	60	14	2.1	54	1.4	81
FEB	7	16	3.6	-	63	780	-	-	35	3.1	76	13	3.3	23	.7	84
MAR	13	186	2.1		75	1000	.22	-	50	2.2	86	15	3.1	52	1.5	98
APR	15	180	2.9	180	115	960	.34	-	44	2.5	78	14	3.3	41	.3	91
MAY	9	192	4.9	75	126	970	.08	-	23	5.5	85	13	2.0	34	.5	77
JUNE	13	174	4.7	85	120	800	.17	-	21	6.4	89	13	6.8	38	1.0	77
JULY	12	190	4.2	120	162	1000	.24	-	26	16.0	81	14	11.0	46	1.5	84
AUG	15	260	3.4	100	162	1120	.18	-	31	10.0	79	14	12.0	45	.9	84
SEPT	9	180	10.8	60	186	1180	.02	-	22	5.8	89	15	3.9	31	1.3	91
OCT	11	186	5.7	75	193	1300	.04	-	25	6.0	87	15	8.6	38	1.0	91
NOV	12	180	3.7	120	108	1730	.08	-	34	7.0	92	15	6.0	40	1.0	91
DEC	19	186	2.4	95	78	1350	.06	-	44	6.0	85	16	4.0	45	-	98
TOTAL	141	2268	-	-	-	-	-	-	394	-	-	171	-	-	-	1047
AVG.	2.4 cu.ft/mil gal	189	3.9	101	121	1070	.14	-	33	6.0	82	14	5.5	41	1.0	87

DIGESTION


RAW SLUDGE ▪▪▪▪▪▪▪▪▪▪▪▪▪
DIGESTED SLUDGE ▬▬▬
AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980


QUANTITY OF SLUDGE - 10^5 gallons
5
4
3
2
1
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

Date Due

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS

1971 OPERATING SUMMARY
PICKERING VILLAGE WATER POLLUTION
CONTROL PLANT.

DATE	ISSUED TO
23.3:73	AGR. CAN. MR. Derrick.

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